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A Study on Factors Affecting Consumers' Purchase Intention Toward Electric Vehicles with Reference to Tata Motors

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ABSTRACT: The transition toward electric vehicles (EVs) is central to achieving sustainable transportation goals in emerging economies such as India. Despite strong policy support and increasing product availability, consumer adoption of EVs remains uneven. This study examines the factors influencing purchase intention toward electric vehicles with specific reference to Tata Motors. A quantitative research design was adopted, and primary data were collected from 100 respondents using a structured questionnaire. Statistical analysis was conducted using SPSS, employing descriptive statistics, correlation analysis, and multiple regression analysis. The results indicate that perceived performance and environmental awareness have a significant positive influence on purchase intention, while price and access to charging infrastructure do not exhibit a statistically significant effect. The findings highlight the growing role of environmental values and performance perceptions in shaping consumer behavior toward EV adoption. The study offers important managerial implications for automobile manufacturers and policymakers, emphasizing the need for performance-oriented communication strategies, sustainability-focused branding, and supportive policy frameworks. The paper contributes to the literature on EV adoption in the Indian context and provides insights for accelerating the diffusion of electric mobility.

KEYWORDS: Electric Vehicles, Purchase Intention, Tata Motors, Environmental Awareness

I. INTRODUCTION

The global automotive industry is undergoing a fundamental transformation driven by environmental concerns, climate change mitigation efforts, and the depletion of fossil fuel resources. Electric vehicles (EVs) have emerged as a viable alternative to conventional internal combustion engine vehicles due to their lower environmental impact and improved energy efficiency. In India, the government has introduced several initiatives, including subsidies and policy incentives, to promote EV adoption. However, consumer acceptance remains a critical challenge.

Tata Motors has emerged as a key player in the Indian EV market, offering models such as the Tata Nexon EV and Tata Tigor EV. Despite these efforts, the rate of EV adoption remains relatively modest. Understanding the factors that influence consumers' purchase intention toward EVs is therefore essential for enhancing market penetration. This study seeks to examine the determinants of EV purchase intention with reference to Tata Motors, focusing on price, perceived performance, environmental awareness, and access to charging infrastructure.

II. REVIEW OF LITERATURE

Research on electric vehicle (EV) adoption has gained substantial attention in recent years due to growing environmental concerns and the global push toward sustainable mobility. Several studies have examined the determinants of consumer intention to adopt electric vehicles across different geographical and economic contexts.

He, Zhan, and Hu (2018) investigated consumer purchase intention toward electric vehicles in China and found that environmental concern and personal innovativeness significantly influence EV adoption. Their study emphasized the mediating role of consumer attitude in shaping purchase intention. Kumar and Alok (2020), through an extensive review of EV literature, identified total cost of ownership, charging infrastructure, and government incentives as major drivers of EV adoption, while highlighting gaps related to consumer awareness and dealership experience.

Singh, Singh, and Vaibhav (2020) conducted a meta-analysis of factors influencing EV adoption and categorized determinants into demographic, psychological, situational, and contextual factors. Their findings revealed that

psychological variables such as environmental attitude and perceived usefulness have a stronger influence on purchase intention than demographic factors. Similarly, Cecinaro et al. (2022) mapped global research on EV consumer behavior and concluded that attitudinal and behavioral dimensions dominate empirical studies, while manufacturer-specific studies remain limited.

In the Indian context, Jaiswal et al. (2021) extended the Technology Acceptance Model and demonstrated that perceived usefulness, ease of use, and environmental concern significantly influence consumers' intention to adopt electric vehicles. Their study also highlighted the moderating role of government incentives in strengthening adoption intention. Cui et al. (2021), applying Maslow's hierarchy of needs, found environmental concern to be the strongest predictor of EV purchase motivation, followed by price consciousness and social influence.

Li et al. (2021) examined the role of consumer innovativeness in sustainable product purchasing and reported that attitude and subjective norms significantly mediate the relationship between innovativeness and purchase intention for electric vehicles. Dhir et al. (2021) explored environmentally responsible behavior and emphasized that perceived benefits and environmental concern strongly influence sustainable consumption intentions.

Although prior studies provide valuable insights into EV adoption behavior, most research focuses on developed markets or adopts a generalized approach without examining manufacturer-specific consumer perceptions. Moreover, limited empirical studies integrate performance perceptions, environmental awareness, and infrastructural factors within a single analytical framework in the Indian EV market. This study builds on existing literature by empirically examining these factors with specific reference to Tata Motors, thereby contributing context-specific insights into electric vehicle purchase intention.

III. RESEARCH GAP

Although prior studies have examined various determinants of EV adoption, limited empirical research focuses specifically on Indian consumers in the context of a single domestic manufacturer. Moreover, existing studies often analyze individual factors in isolation rather than examining their combined influence on purchase intention. This study addresses this gap by empirically testing multiple determinants of EV purchase intention with specific reference to Tata Motors.

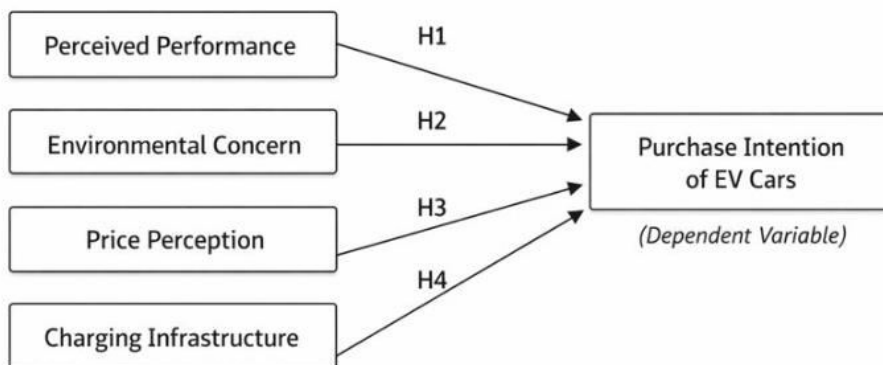
OBJECTIVES OF THE STUDY:

1. To examine the demographic profile of consumers considering Tata Motors electric vehicles.
2. To analyze the relationship between selected factors influencing EV adoption.
3. To assess the impact of above factors on consumers' purchase intention toward Tata Motors EVs.

HYPOTHESES:

- H01: Price has no significant relationship with purchase intention toward electric vehicles.
- H02: Perceived performance has no significant relationship with purchase intention toward electric vehicles.
- H03: Access to charging infrastructure has no significant relationship with purchase intention toward electric vehicles.
- H04: Environmental awareness has no significant relationship with purchase intention toward electric vehicles.

Conceptual model of the study



IV. RESEARCH METHODOLOGY

Research Design

The study adopts a quantitative and descriptive research design to examine the factors influencing consumers’ purchase intention toward electric vehicles with specific reference to Tata Motors. A quantitative approach is appropriate as the study seeks to measure relationships between variables and test hypotheses using statistical techniques.

Sources of Data

A sample of 100 respondents was selected for the study. Convenience sampling technique was employed due to accessibility and time constraints, which is commonly adopted in exploratory and consumer behavior studies

The study relies on both primary and secondary data sources. Primary data were collected directly from respondents using a structured questionnaire.

Data Collection Instrument

A structured questionnaire was designed based on insights from previous studies. The questionnaire consisted of two sections: the first section captured demographic information of respondents, while the second section measured key constructs such as price perception, perceived performance, charging infrastructure availability, environmental awareness, and purchase intention. Responses were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Statistical Tools and Techniques

Data analysis was performed using Statistical Package for the Social Sciences (SPSS). The following statistical tools were employed:

- Descriptive statistics to summarize respondent characteristics and key variables
- Reliability analysis to test internal consistency of the scale
- Correlation analysis to examine relationships among variables
- Multiple regression analysis to assess the impact of independent variables on purchase intention

IV. DATA ANALYSIS AND INTERPRETATION

Table1: Descriptive Statistics of Key Variables

Variable	Mean	Standard Deviation
Purchase Intention	3.39	0.95
Price	3.66	0.78
Perceived Performance	3.78	0.87
Charging Infrastructure	3.44	0.78
Environmental Awareness	3.83	0.97

Interpretation: The descriptive statistics indicate relatively higher mean values for perceived performance and environmental awareness, suggesting their greater relevance in shaping consumers’ purchase intention toward electric vehicles. Purchase intention reflects a moderate inclination toward EV adoption among respondents.

Table2: Multiple Regression Analysis (Dependent Variable: Purchase Intention)

Predictor Variable	β (Standardized)	t-value	Sig. (p-value)
Price	-0.010	-0.090	0.928
Perceived Performance	0.531	3.423	0.001
Charging Infrastructure	-0.146	-1.173	0.244
Environmental Awareness	0.457	2.630	0.010

Model Statistics: F = 3.44, p = 0.011, R² = 0.126

Interpretation: The regression model is statistically significant. Perceived performance and environmental awareness exert a significant positive influence on purchase intention, while price and charging infrastructure do not show a significant effect.

Table3: Correlation between Reliability Perception and Recommendation Intention

Variables	Reliability	Recommendation
Reliability	1.00	0.460**
Recommendation	0.460**	1.00

Correlation is significant at the 0.01 level (2-tailed).

Interpretation: A moderate positive correlation exists between perceived reliability and consumers’ willingness to recommend electric vehicles, indicating the importance of trust and reliability in advocacy behavior.

Table 4: Hypothesis Testing Results Based on SPSS Regression Output

Hypothesis	Independent Variable	Statistical Test	β Value	t-value	Sig. (p-value)	Decision
H01	Price	Multiple Regression	-0.010	-0.090	0.928	Accepted
H02	Perceived Performance	Multiple Regression	0.531	3.423	0.001**	Rejected
H03	Charging Infrastructure	Multiple Regression	-0.146	-1.173	0.244	Accepted
H04	Environmental Awareness	Multiple Regression	0.457	2.630	0.010*	Rejected

Significant at 1% level. *Significant at 5% level

Interpretation: The SPSS regression results clearly indicate that perceived performance and environmental awareness significantly influence consumers’ purchase intention toward electric vehicles, as their p-values are below the 0.05 significance level. Hence, the null hypotheses H02 and H04 are rejected. Conversely, price and charging infrastructure do not show a statistically significant impact on purchase intention, leading to the acceptance of H01 and H03. These findings suggest that attitudinal and performance-related factors outweigh economic and infrastructural considerations in shaping EV purchase decisions in the context of Tata Motors.

V. FINDINGS AND DISCUSSION:

The findings of the study provide meaningful insights into the factors influencing consumers’ purchase intention toward electric vehicles with specific reference to Tata Motors. The analysis reveals that perceived performance and environmental awareness emerge as the most significant determinants of purchase intention, while price and charging infrastructure do not exert a statistically significant influence.

The significant impact of perceived performance indicates that consumers place high importance on attributes such as vehicle reliability, driving range, safety features, and overall technological efficiency when considering electric vehicles. This finding aligns with earlier studies which suggest that consumers are more inclined to adopt EVs when they perceive them to be comparable or superior to conventional vehicles in terms of performance. In the context of Tata Motors, this suggests that improvements in battery technology, vehicle durability, and performance communication play a critical role in shaping consumer attitudes.

Environmental awareness was also found to have a strong positive influence on purchase intention. This reflects a growing consciousness among consumers regarding environmental sustainability, carbon emissions, and climate change. The finding supports prior research indicating that environmentally responsible behavior significantly drives the adoption of sustainable products such as electric vehicles. The result implies that consumers increasingly view EVs not merely as economic alternatives but as ethical and environmentally responsible choices.

Overall, the discussion suggests that psychological and performance-related factors are more influential than economic and infrastructural factors in determining electric vehicle purchase intention. These findings reinforce the importance of aligning marketing strategies, product development, and policy initiatives with evolving consumer values and perceptions in order to accelerate electric vehicle adoption.

VI. CONCLUSION

This study contributes to the growing literature on electric vehicle adoption by providing empirical evidence from the Indian market. The results highlight perceived performance and environmental awareness as key drivers of purchase intention toward Tata Motors electric vehicles. By aligning product strategies and policy initiatives with these factors, stakeholders can accelerate the adoption of electric mobility and support the transition toward sustainable transportation.

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